AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A field-effect transistor comprising:

a channel layer that is formed on a predetermined semiconductor layer and has an impurity concentration varying from a low value to a high value; and

a source region and a drain region each having a bottom face located in said channel layer, said bottom faces being above an interface ~~that is defined~~ between the predetermined semiconductor layer and ~~is provided within~~ the channel layer.

Claim 2 (Original): The field-effect transistor as claimed in claim 1, wherein the impurity concentration varies linearly or exponentially.

Claim 3 (Original): The field-effect transistor as claimed in claim 1, wherein the impurity concentration is $1.0 \times 10^{16}/cm^3$ or higher.

Claim 4 (Original): The field-effect transistor as claimed in claim 1, wherein the impurity contained in the channel layer is at least one of selenium, silicon, carbon, beryllium, and magnesium.

Claim 5 (Currently Amended): A field-effect transistor comprising:

a channel layer that is formed on a predetermined semiconductor layer and has a composition that varies so that ~~in which~~ a saturation electron velocity varies from a low value to a high value as getting away from the predetermined semiconductor layer; and

a source region and a drain region each having a bottom face located in said channel layer, said bottom faces being above an interface ~~that is defined~~ between the predetermined semiconductor layer and ~~is provided within~~ the channel layer.

Claim 6 (Original): The field-effect transistor as claimed in claim 5, wherein the channel layer has the composition ratio of a predetermined material linearly or exponentially decreasing or increasing as the distance from the predetermined semiconductor layer increases.

Claim 7 (Original): The field-effect transistor as claimed in claim 5, wherein the predetermined material is at least one of gallium, indium, aluminum, and antimony.

Claim 8 (Original): The field-effect transistor as claimed in claim 1, wherein:

the predetermined semiconductor layer is a buffer layer that is formed on a semiconductor substrate; and

the bottom faces of the source region and the drain region are located within the channel layer.

Claim 9 (Withdrawn): A method of producing a field-effect transistor, comprising the steps of:

growing a channel layer on a predetermined semiconductor layer, while varying an impurity concentration from a low value to a high value; and

forming a source region and a drain region each having a bottom face above the predetermined semiconductor layer.

Claim 10 (Withdrawn): The method as claimed in claim 9, wherein the step of growing a channel layer includes linearly or exponentially increasing the impurity concentration during the growth of the channel layer.

Claim 11 (Withdrawn): The method as claimed in claim 9, wherein the step of growing a channel layer includes linearly or exponentially increasing the temperature of an effusion cell for the impurity to be introduced into the channel layer.

Claim 12 (Withdrawn): The method as claimed in claim 9, wherein the impurity is at least one of selenium, silicon, carbon, beryllium, and magnesium.

Claim 13 (Withdrawn): A method of producing a field-effect transistor, comprising the steps of:

growing a channel layer on a predetermined semiconductor layer, while varying the composition ratio of a predetermined composition from a low value to a high value; and

forming a source region and a drain region each having a bottom face above the predetermined semiconductor layer.

Claim 14 (Withdrawn): The method as claimed in claim 13, wherein the step of growing a channel layer includes linearly or exponentially increasing or decreasing the flow rate of a gas containing a predetermined organic metal.

Claim 15 (Withdrawn): The method as claimed in claim 14, wherein the predetermined organic metal is trimethylgallium and/or triethylgallium, trimethylindium, trimethylaluminum, or trimethylantimony.

Claim 16 (Withdrawn): The method as claimed in claim 13, wherein the step of growing a channel layer includes linearly or exponentially increasing or decreasing the temperature of an effusion cell for the material that forms the predetermined composition.

Claim 17 (Withdrawn): The method as claimed in claim 13, wherein the predetermined composition is at least one of a gallium composition, an indium composition, an antimony composition, and an aluminum composition.

Claim 18 (Withdrawn): The method as claimed in claim 9, wherein the step of forming a source region and a drain region includes implanting predetermined ions to such a depth that does not reach the predetermined semiconductor layer.